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10/508,751	04/13/2005	Olaf Pichler	P/63625	8350

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EXAMINER	
LIU, LI	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/508,751	PICHLER ET AL.
	Examiner	Art Unit
	LI LIU	2613

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 March 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *15 and 17-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *15 and 17-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 September 2004 and 26 August 2008* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 15 and 17-29 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 15 and 17-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant admitted prior art (AAPA: Figure 1 is a known optical cross-connect, and page 3 line 22 to page 6 line 6, and page 10 line 1) in view of Maeda (US 2003/0044109).

1). With regard to claim 15, the AAPA discloses an optical cross-connect (OXC) for use in a wavelength division multiplex (WDM) network (Figure 1, or following Figure O1), comprising:

a) a plurality of optical inputs (I1 to IM in Figure 1) for receiving respective WDM communication bearing radiation having channels;

b) a plurality of optical outputs (O1 to OM in Figure 1) for outputting the respective WDM radiation switched by the OXC;

c) a single stage optical switching matrix (S1 to SN in Figure 1) for switching the WDM radiation between the optical inputs and outputs, the optical switching matrix comprising a respective switching matrix for each wavelength channel of the WDM radiation (page 3 line 22 to page 6 line 6);

d) a further plurality of optical inputs (e.g., the ADD ports λ1 to λN in Figure 1) and outputs (e.g., the DROP ports λN to λ1 in Figure 1) for respectively adding and dropping selected wavelength channels.

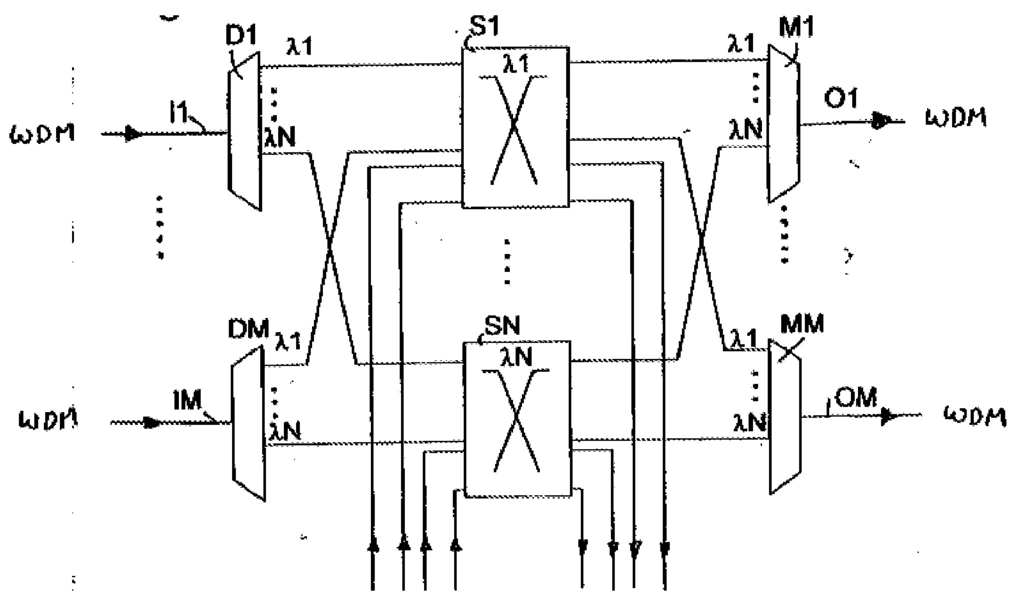

Figure O1

But, the AAPA does not expressly disclose a respective multistage optical switching matrix for selectively connecting the further plurality of optical inputs and outputs to inputs and outputs of the single stage switching matrix, the multistage switching matrix comprising a multistage Clos network in which the single stage switching matrix comprises one stage of the Clos network.

However, Maeda, in the same field of endeavor, discloses a three-stage optical switching matrix (e.g., the switches 23a,b,c,d, 42a,b and 43a,b in Figure 8) for selectively connecting the further plurality of optical inputs (the ADD1/ADD2 inputs to switch 43ab) to inputs of the single stage switching matrix (the switching matrix 23a,b,c,d in Figure 8); and the three-stage switching matrix comprising a multistage Clos network in which the single stage switching matrix (e.g., the switches 23a,b,c,d in Figure 8) comprises one stage of the Clos network (the so-called Clos network has three stages, each stage is made of a number of switches; the cross-connect architecture in Figure 8 can be viewed to be formed by a Clos network: first stage matrix “23a,b,c,d”, second stage matrix “42a,b”, and third stage "43a,b”). And Maeda also discloses a multistage optical switching matrix (e.g., the switches 33a,b and 35a,b in Figure 8) for selectively connecting the further plurality of optical outputs (the Drop1/Drop2 ports associated with switch 35a,b) to the drop paths (e.g., signals from 21a,b,c,d in Figure 8). By using multi-stage switching matrix, Maeda provides full interconnectivity between any one of inter-station lines and any desired line of the intra-station lines (or clients) ([0079] and [0081]).

Then, the combination of the AAPA and Maeda discloses a system shown as following Figure O2:

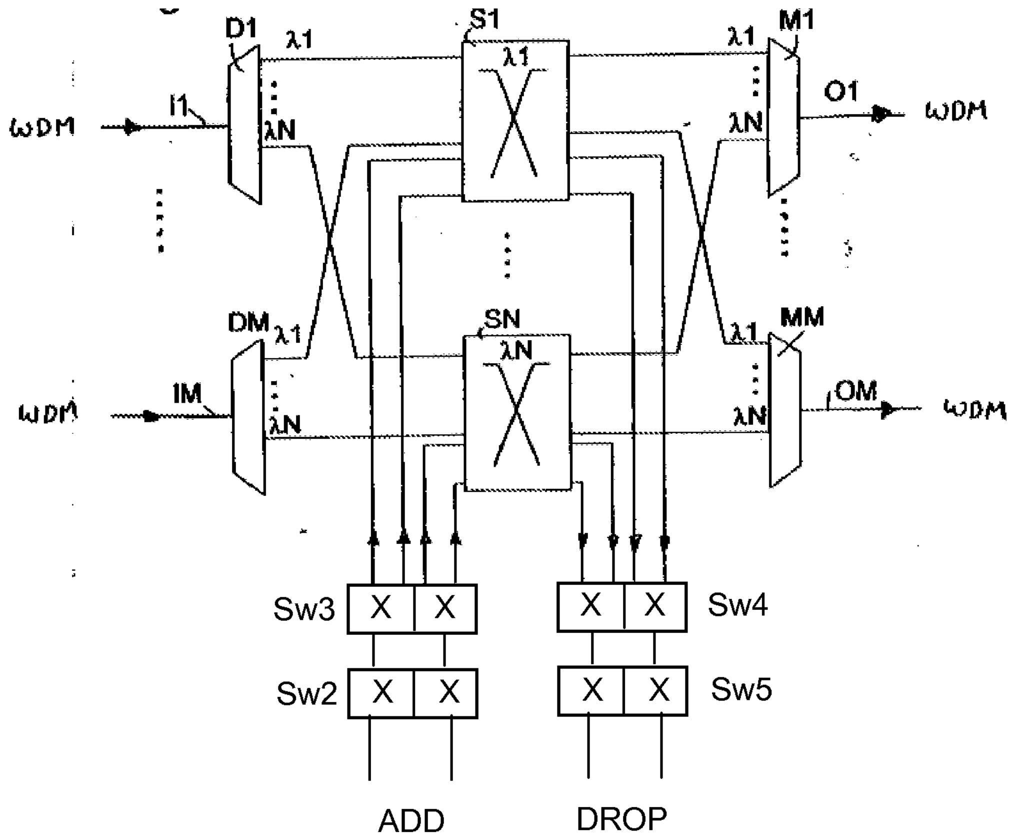

Figure O2

That is, the combination of the AAPA and Maeda teaches a multistage optical switching matrix for selectively connecting the further plurality of optical inputs (the ADD in Figure O2) and outputs (the DROP in Figure O2) to inputs and outputs of the single stage switching matrix (S1-SN), the multistage switching matrix comprising a multistage Clos network in which the single stage switching matrix comprises one stage of the Clos network.

Maeda provides an optical ADM scheme with high reliability and that the multi-stage switching matrix can be used in the add and drop paths, and the multistage

switching network provides full interconnectivity between any one of inter-station lines and any desired line of the intra-station lines (or clients). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the teaching of Maeda to the system of AAPA so that the system provides a non-blocking switching and enables routing of any channel that is added or dropped, and enables the full interconnectivity between all the incoming channels that can potentially be dropped locally, and any added channel can be guided to a desired line.

2). With regard to claim 17, the AAPA discloses an optical cross-connect (Figure 1, or Figure O1 above), comprising:

a) a plurality of input channels (I1 to IM in Figure 1) for through traffic;

b) a plurality of output channels (O1 to OM in Figure 1) for the through traffic;

c) a first group of optical switching matrices (S1 to SN in Figure 1) for connecting each through traffic input channel to any of the through traffic output channels, each through traffic input channel being connected to an input of a switching matrix of the first group, and each through traffic output channel being connected to an output of the switching matrix of the first group (Figure 1, and page 3 line 22 to page 6 line 6); and

d) a third plurality of input channels for adding traffic (e.g., the ADD ports λ1 to λN in Figure 1).

But, the AAPA does not expressly disclose each of the input channels add traffic input channel being connected to an input of a second group of switching matrices, wherein outputs of the second group of switching matrices are connected to inputs of a third group of switching matrices, and outputs of the third group of switching matrices

are connected to inputs of the first group of switching matrices such that the switching matrices of the second, third and first groups form a Clos network.

However, Maeda, in the same field of endeavor, discloses a multistage optical switching matrix (e.g., the switches 23a,b,c,d, 42a,b and 43a,b in Figure 8), in which each of the input channels (the ADD1/ADD2 inputs to switch 43ab) add traffic input channel being connected to an input of a second group of switching matrices (e.g., the switch 43a,b in Figure 8), wherein outputs of the second group of switching matrices are connected to inputs of a third group of switching matrices (e.g., the switch 42a,b in Figure 8), and outputs of the third group of switching matrices are connected to inputs of the first group of switching matrices (the switches 23a,b,c,d in Figure 8), such that the switching matrices of the second, third and first groups form a Clos network (the so-called Clos network has three stages, each stage is made of a number of switches; the cross-connect architecture in Figure 8 can be viewed to be formed by a Clos network: first stage matrix “23a,b,c,d”, second stage matrix “42a,b”, and third stage "43a,b”). By using multi-stage switching matrix, Maeda provides full interconnectivity between any one of inter-station lines and any desired line of the intra-station lines (or clients) ([0079] and [0081]).

That is, the combination of the AAPA and Maeda teaches a multistage optical switching matrix (as shown in Figure O2 above), and the switching matrices of the second, third and first groups form a Clos network.

Maeda provides an optical ADM scheme with high reliability and that the multi-stage switching matrix can be used in the add and drop paths, and the multistage

switching network provides full interconnectivity between any one of inter-station lines and any desired line of the intra-station lines (or clients). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the teaching of Maeda to the system of AAPA so that the system provides a non-blocking switching and enables routing of any channel that is added or dropped, and enables the full interconnectivity between all the incoming channels that can potentially be dropped locally, and any added channel can be guided to a desired line.

3). With regard to claim 18, the AAPA and Maeda disclose all of the subject matter as applied to claim 17 above. And the AAPA Maeda further disclose the OXC comprising a plurality of demultiplexers (D1 to DM in Figure 1 of the AAPA), each having an input for connection to an optical input which carries WDM radiation comprising a plurality of wavelength channels (e.g., $\lambda 1$ to λN in Figure 1), and a plurality of outputs for outputting one of these wavelength channels to one of the through traffic input channels (page 3 line 22 to page 6 line 6).

4). With regard to claim 19, the AAPA and Maeda disclose all of the subject matter as applied to claims 17 and 18above. And the AAPA and Maeda further disclose each demultiplexer is connected to each switching matrix of the first group by one input channel (Figure 1 of the AAPA or Figure O2 above, page 3 line 22 to page 6 line 6).

5). With regard to claim 20, the AAPA and Maeda disclose all of the subject matter as applied to claims 17 and 18 above. And the AAPA and Maeda further disclose the demultiplexers are wavelength demultiplexers (Figure 1 of the AAPA, or Figure O2 above, the demultiplexer is a wavelength demultiplexer) outputting a respective

wavelength channel to an output defined according to a carrier wavelength of the wavelength channel, and the outputs of various demultiplexers for outputting the wavelength channels of a same carrier wavelength are connected to a same switching matrix of the first group (Figure 1 of the AAPA, or Figure O2 above, page 3 line 22 to page 6 line 6).

6). With regard to claim 21, the AAPA and Maeda disclose all of the subject matter as applied to claim 17 above. But, the AAPA and Maeda disclose does not expressly disclose wherein each switching matrix of the second group has a number M of inputs for adding traffic, and a number of at least 2M-1 outputs connected to inputs of switching matrices of the third group. However, since combination of the AAPA and Maeda teaches that the second group is the first stage of the Clos network, therefore, based on the Clos architecture, it is obvious that the second group can be made to have a number M of inputs for adding traffic, and a number of at least 2M-1 outputs connected to inputs of switching matrices of the third group so to provide full interconnectivity between all the incoming channels that can potentially be dropped locally and the clients, and any dropped wavelength channel originating from any input fibre can be directed to any client.

7). With regard to claim 22, the AAPA and Maeda disclose all of the subject matter as applied to claim 17 above. And the AAPA and Maeda further disclose wherein each optical switching matrix of the first group has a number M of outputs for through traffic (Figure 1 of the AAPA or Figure O2 above, the number of outputs of each optical switching matrix of the first group has a number M of outputs which is the same as the

number of multiplexers O1 to OM), and a number of at least 2M-1 inputs connected to outputs of switching matrices of the third group (the AAPA discloses that the number of inputs can be M+N, when N is greater than M, the number of inputs is greater than 2M-1).

8). With regard to claim 23, the AAPA discloses an optical cross-connect (Figure 1, or Figure O1 above), comprising:

a) a plurality of input channels (I1 to IM in Figure 1) for through traffic;

b) a plurality of output channels (O1 to OM in Figure 1) for the through traffic;

c) a first group of optical switching matrices (S1 to SN in Figure 1) for connecting each through traffic input channel with any of the through traffic output channels, each through traffic input channel being connected to an input of a switching matrix of the first group, and each through traffic output channel being connected to an output of a switching matrix of the first group (Figure 1, and page 3 line 22 to page 6 line 6);

d) a plurality of output channels for dropping traffic (e.g., the DROP ports $\lambda 1$ to λN in Figure 1).

But, the AAPA does not expressly disclose each drop traffic output channel being connected to an output of a fifth group of switching matrices, wherein inputs of the fifth group of switching matrices are connected to outputs of a fourth group of switching matrices, and inputs of the fourth group of switching matrices are connected to outputs of the first group of switching matrices such that the switching matrices of the first, fourth and fifth groups form a Clos network.

However, Maeda, in the same field of endeavor, discloses a multistage optical switching matrix (Figure 8), in which each drop traffic output channel (e.g., the Drop1/Drop2 in Figure 8) being connected to an output of a fifth group of switching matrices (switches 35a,b in Figure 8), wherein inputs of the fifth group of switching matrices are connected to outputs of a fourth group of switching matrices (e.g., the switch 33a,b in Figure 8), and inputs of the fourth group of switching matrices are connected to outputs of the couplers (21a,b,c,d in Figure 8). And Maeda also discloses a multistage optical switching matrix (e.g., the switches 23a,b,c,d, 42a,b and 43a,b in Figure 8) for selectively connecting the further plurality of optical inputs (the Add1/Add2 ports associated with switch 43a,b) to the add paths (e.g., Add1/Add2 in Figure 8). By using multi-stage switching matrix, Maeda provides full interconnectivity between any one of inter-station lines and any desired line of the intra-station lines (or clients) ([0079] and [0081])..

That is the combination of the AAPA and Maeda teach a multistage optical switching matrix (as shown in Figure O2 above), and the switching matrices of the Sw5, Sw4 and S1-SN shown in Figure O2 form a Clos network.

Maeda provides an optical ADM scheme with high reliability and that the multi-stage switching matrix can be used in the add and drop paths, and the multistage switching network provides full interconnectivity between any one of inter-station lines and any desired line of the intra-station lines (or clients). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the teaching of Maeda to the system of AAPA so that the system provides a non-blocking

switching and enables routing of any channel that is added or dropped, and enables the full interconnectivity between all the incoming channels that can potentially be dropped locally, and any added channel can be guided to a desired line.

9). With regard to claim 24, the AAPA and Maeda disclose all of the subject matter as applied to claim 23 above. And the AAPA and Maeda further disclose a plurality of multiplexers (M1 to MM in Figure 1 of the AAPA), each having an output for connecting to an optical output which carries WDM radiation comprising a plurality of wavelength channels (e.g., $\lambda 1$ to λN in Figure 1), and a plurality of inputs for inputting one of these wavelength channels from one of the through traffic output channels (page 3 line 22 to page 6 line 6).

10). With regard to claim 25, the AAPA and Maeda disclose all of the subject matter as applied to claims 23 and 24 above. And the AAPA and Maeda further disclose each multiplexer is connected to each switching matrix of the first group by one output channel (Figure 1 of the AAPA or Figure O2 above).

11). With regard to claim 26, the AAPA and Maeda disclose all of the subject matter as applied to claim 23 above. But, the AAPA and Maeda do not expressly disclose each optical switching matrix of the fifth group has a number M of outputs for dropping traffic, and a number of at least 2M-1 inputs connected to outputs of switching matrices of the fourth group. However, since the combination of AAPA and Maeda teaches that the fifth group is the third stage of the Clos network, therefore, based on the Clos architecture, it is obvious that the fifth group can be made to have a number M of outputs for dropping traffic, and a number of at least 2M-1 inputs connected to

outputs of switching matrices of the fourth group so to provide full interconnectivity between all the incoming channels that can potentially be dropped locally and the clients, and any dropped wavelength channel originating from any input fibre can be directed to any client.

12). With regard to claim 27, the AAPA and Maeda disclose all of the subject matter as applied to claim 23 above. And the AAPA and Maeda further disclose each optical switching matrix of the first group has a number M of inputs for through traffic (Figure 1 of the AAPA or Figure O2 above, the number of outputs of each optical switching matrix of the first group has a number M of outputs which is the same as the number of multiplexers O1 to OM), and a number of at least 2M-1 outputs connected to inputs of switching matrices of the fourth group (the AAPA discloses that the number of outputs of each switching matrix of the first group can be M+N, when N is greater than M, the number of inputs is greater than 2M-1).

13). With regard to claims 28 and 29, the AAPA and Maeda disclose all of the subject matter as applied to claims 17 and 23 above. And the AAPA and Maeda further disclose the second group of optical switching matrices are identical, and the fifth group of optical switching matrices are identical (e.g., Maeda: the switches 43a and 43b are identical 2x2 switch; and 35a and 35b are identical 2x2 switches).

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to LI LIU whose telephone number is (571)270-1084. The examiner can normally be reached on Monday-Friday, 8:30 am - 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Vanderpuye can be reached on (571)272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Li Liu/
Examiner, Art Unit 2613
May 23, 2009